



United States  
Department of  
Agriculture

Soil  
Conservation  
Service

Bozeman,  
Montana



# ANACONDA EROSION CONTROL AND STABILIZATION

## CRITICAL AREA TREATMENT R C & D MEASURE PLAN AND ENVIRONMENTAL ASSESSMENT

DEER LODGE COUNTY, MONTANA

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ANACONDA EROSION CONTROL AND STABILIZATION  
CRITICAL AREA TREATMENT  
RC&D MEASURE PLAN  
AND ENVIRONMENTAL ASSESSMENT

30-6003-023-199

MONTANA

Sponsored By

Anaconda-Deer Lodge City-County Government  
Deer Lodge Valley Conservation District  
Headwaters Resource Conservation and Development Area

Prepared With Assistance From

U.S. Department of Agriculture  
Soil Conservation Service  
Bozeman, Montana

July 1986

Prepared under the authority of Sections 1528-1538 of the Agriculture and Food Act of 1981 (Public Law 97-98).

wln96-87476



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MEASURE PLAN AGREEMENT

between the

Anaconda-Deer Lodge City-County Government  
Deer Lodge Valley Conservation District  
(Referred to herein as sponsors)

and the

Soil Conservation Service  
United States Department of Agriculture  
(Referred to herein as SCS)

(a) Investigation of the measure area indicates that no displacements will be involved under the present conditions. However, in the event that displacement becomes necessary at a later date, the cost of relocation assistance and payments under the Uniform Act will be shared by sponsors and SCS as follows:

	<u>Percent</u>
Sponsors	29
SCS	71
Total	100

(b) Through a request of the Anaconda-Deer Lodge City-County Government and the Deer Lodge Valley Conservation District and the cooperative efforts of the sponsors and the Soil Conservation Service this mutually agreeable Resource Conservation and Development (RC&D) measure plan has been completed. This RC&D measure has been adopted by the Headwaters RC&D Council and included in the RC&D area plan as a means to accomplish objectives for the area.

(c) This is not a fund-obligating document. Financial and other assistance to be furnished by SCS in carrying out the work in this plan is contingent on the appropriation of funds for this purpose. A separate agreement will be entered into between SCS and the sponsors before either party initiates work involving funds of the other party. Such an agreement will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific improvements to be installed.

(d) The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964 and the Regulations of the Secretary of Agriculture (7 CFR Sec. 15.1-15.12) which provide that no person in the United States shall, on the basis of race, color, national origin, sex, age, handicap, marital status, or religion, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any activity receiving federal financial assistance.



(e) No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit arising from it. However, this clause does not apply to this agreement to the extent that this agreement is made with a corporation for the corporation's general benefit.

(f) This plan may be amended, revised, or terminated by mutual agreement of the parties hereto, except for cause.

ANACONDA-DEER LODGE CITY-COUNTY GOVERNMENT

By: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

Authorized by a resolution of the Anaconda-Deer Lodge City-County Government at a meeting held on \_\_\_\_\_.  
(date)

DEER LODGE VALLEY CONSERVATION DISTRICT

By: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

Authorized by a resolution of the Deer Lodge Valley Conservation District at a meeting held on \_\_\_\_\_.  
(date)

SOIL CONSERVATION SERVICE  
UNITED STATES DEPARTMENT OF AGRICULTURE

By: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_



## PLANNING AREA

The 664 acre project area is located in central Deer Lodge County in southwestern Montana. The project is on the northeast end of the Pintlar Mountain Range and is adjacent to the city of Anaconda. See Location Map. The 664 acre RC&D project area is part of a 2522 acre area that is being revegetated by Anaconda-Deer Lodge. The city of Anaconda and the county of Deer Lodge are combined unit of local government with a population of 12,500. About two thirds of the population is located in the city of Anaconda.

Prior to the late 1800's the hills locally referred to as the "A" and "C" hills were vegetated by a mosaic of Douglas-fir and Aspen stands intermixed with grasslands. See Project Map. Refining of copper started adjacent to the project area in the late 1800's and continued until 1980. In the late 1800's the smelters were located north of and across the valley from the project area. In the early 1900's the smelter was moved adjacent to and east of the project area. The area east of the project has been declared an EPA Superfund cleanup site. In the late 1800's and early 1900's parts of the project area were extensively logged. Immediately after the logging operations, much of the area exhibited major problems with soil erosion. The removal of the natural vegetative cover, combined with heavy metal pollution within the soil, and a harsh climate, has inhibited the re-establishment of ground cover. The project area is currently a mixture of rock fragments, erosion pavement, bare soil, patches of grass, occasional Rocky Mountain juniper shrubs and clumps of quaking aspen.

The elevation in the project area ranges from 5500 feet near the city of Anaconda to 7193 feet at the "C" hill. The area contains three main geologic types: quartzites, extrusive fine-grained volcanic rocks, and limestones. Heavy metal pollution containing elements such as copper, iron, lead, zinc, cadmium, and arsenic are in abundance in the top two inches of soil in most of the project area. The limestone parent materials have a naturally high pH and neutralize the toxic effects of heavy metals pollution.

The soils in the project area are eroded and polluted. Part of the soils in the project area have slopes between 35 and 60 percent. These soils have a very gravelly loam surface and subsoils. They formed in materials derived from volcanic and quartzite rocks. These soils originally supported grass and a few trees. Surface pH of these soils may be as low as 5.0. Soils in another part of the project have slopes between 35 and 70 percent. These soils are shallow over the limestone and volcanic parent materials. The soils on these slopes are poorly vegetated.

Other parts of the project area have soils with slopes between 15 and 35 percent. The surface is very gravelly loam and the subsoil is a very gravelly clay loam. The soil formed in materials derived from volcanic and quartzite rock. Surface pH varies from 4.2 to 5.3. From a 2 to 10 inch depth the pH improves to 6.2 to 7.7.



Most of the land in the project area is currently owned by the Atlantic Richfield company (ARCO). ARCO has agreed to transfer ownership of the land to Anaconda-Deer Lodge City-County government in 1987. There are also 30 acres of USDA-Forest Service land within the project. The visual quality is low since the area is covered with little vegetation. However the area is still used for walk-in and drive in recreation and viewing the landscape above the project area. Land use in the future will not likely change except that drive-in recreation may be restricted.

#### PROBLEMS AND OPPORTUNITIES

The critical resource problem is the high rate of erosion that is occurring in the project area. Up to 12 inches of soil has been lost off the project since smelting operations began in the late 1800's. There are 149 acres out of 664 acres in the project area that are eroding at a rate greater than the allowable tolerance. The erosion rate is as high as 45 tons per acre per year in some parts of the project area. The next highest eroding area is eroding at a rate of 24 tons per acre per year. The allowable soil loss tolerance for these soils is 3 tons per acre per year. Erosion at rates greater than the allowable tolerance means that the soil is eroding at a rate greater than it is being formed.

The runoff coming from the project area causes flood damage to homes and yards in the city of Anaconda. In some years, the flooding is accompanied by mud flows. These mud flows flow down streets and plug storm drains. Rapid runoff has washed out a portion of the road which accesses the "C" hill. This has increased maintenance costs for the city-county government. The sediment laden runoff then flows into Warm Springs Creek, which is an important fish spawning area.

Spotted knapweed, a noxious weed in Montana, is growing on the lower area of the project. Without adequate cover this aggressive weed will likely spread rapidly throughout the project area. Since this weed has a toxic effect on other vegetation, establishment of vegetation on the eroding areas would become more difficult in the future.

The opportunity exists to improve the visual quality of the area. The Anaconda-Deer Lodge City-County government, community leaders, civic organizations, and local schools have been planting trees in the project area in an attempt to improve the scenic beauty of the area. When these trees get older and more trees are planted they will reduce the peak runoff and smooth out the flows. The Anaconda-Deer Lodge City-County government submitted a request for money from the State of Montana and received the money to plant trees and install sediment basins in the major drainages. The Montana Department of State Lands has provided assistance in the tree planting. The Anaconda Kiwanis Club has received a grant from the American Forestry Association to plant trees in the project area. If grass and shrubs were planted in the critical eroding areas the major resource problems of the project area would be solved.



PHOTO PLATE 1



In 1886 the project area was covered with vegetation.  
(Tri-County Historical Society Photo)

By 1905 all trees had been removed and erosion was starting on the steep slopes.  
(Tri-County Historical Society Photos)





PHOTO PLATE 2



Some shrubs were growing in the area in 1923, but the steep slopes were bare and erosion was accelerating. (Tri County Historical Society Photo)

By 1986 erosion had caused steep gullies to develop. (SCS Photo)





## RESOURCE EVALUATIONS

Formal public scoping of the project measure occurred during a public meeting held in January, 1986. No environmental concerns were expressed at this meeting. Those in attendance at the meeting expressed support for the project. The Montana Clearinghouse procedure was used in December, 1985 to determine public interest in participating in planning the project or opposing the project. No comments were received.

Formal interagency environmental scoping of the project was held in Anaconda in June, 1986. Representatives of the U.S. Fish and Wildlife Service and the Montana Department of Fish, Wildlife and Parks participated in the scoping meeting. The nature of problems and alternatives for solving the erosion problem were reviewed and evaluated for possible adverse environmental impacts. Scoping showed that there were no serious deleterious impacts associated with implementing the project. Several positive impacts were identified. No formal studies and/or investigations were recommended as part of the environmental evaluation process. The environmental assessment is in appendix A.

A cultural resource inventory was conducted for the project. No known prehistoric or historic cultural resources would be impacted by project action. A visual resource evaluation was also conducted.

An interdisciplinary planning team evaluated the project area. Soil scientists mapped the project area and soil samples were taken for analysis. Soil samples were taken at depths of 0-2 inches, 2-10 inches and 10-30 inches in several locations. Trace elements, common cations, and pH were analyzed.

The project area was divided into subareas that had similar problems and treatment needs. The Universal Soil Loss Equation (USLE) was used to estimate sheet and rill erosion. Gully erosion was calculated and added to the sheet and rill erosion estimate.

Treatment alternatives were developed based on soil survey data, soil analysis, slope steepness, existing vegetation, and an estimate of the vegetation that grew in the project area before the smelters were built. Different methods of installing the critical area treatments were also investigated.

## PLANNING OBJECTIVES AND ALTERNATIVES

Objectives of this measure plan are to reduce excessive erosion, reduce the amount of sediment flowing down streets and entering storm drains of Anaconda, and improve the visual quality of the area.

The objectives of this measure plan are consistent with the Headwaters RC&D Area and the Deer Lodge Valley Conservation District's policy on the use and development of land and water resources.



Several elements were identified early in the planning process to solve the erosion and sediment problem. Structural and nonstructural elements were identified. Sediment basins, and the planting of trees, shrubs, and grasses were elements that could be included in alternatives to address the problems. Difficult site conditions due to slope, soils, toxic metals, noxious weeds, and climatic limitations reduce the number of acceptable alternatives.

Alternatives were developed that could reduce the sediment problems for the city of Anaconda. Installation of sediment basins could provide a fast but only short term solution to the sediment problem. However since the steeply eroding areas of the project are directly adjacent to the city there was only one site where a sediment structure could be installed. The city is presently installing a sediment basin in a drainage on the east side of the project.

Trees could be planted to provide a long term stabilization to the erosion and sediment problem. The trees would reduce the hydrologic runoff peak, even out the runoff and improve the visual quality of the area. However it would be 20 or 30 years before trees could reduce the erosion and sediment problem. Trees have been and are currently being planted in the project area.

Grass and shrub plantings were the last two elements considered. Planting these elements in combination with each other would reduce the erosion and sediment problem to tolerable limits for 135 acres. With the two feasible plan elements identified, planning then focused on different methods of establishment.

All but 14 acres, of the 149 acres with erosion problems, were found to be feasible for treatment. The 14 acres have severe erosion occurring, but no feasible solution could be developed. The slopes in the 14 acre area are very steep and have a southerly aspect. The area includes some shallow soils and rock outcrops. The aspect and soils combine to create a droughty condition for the few plants that grow there.

Four methods for planting grasses and two methods for planting shrubs have been identified. Hydromulching was rejected as a viable method of planting the grass due to poor access to the areas needing treatment. Aerial seeding was also rejected because of the toxic metals in the top two inches of the soil. The surface must be disturbed so the seed can be placed in soil material suitable for plant growth. This leaves hand planting and mechanical methods as the two feasible options. Mechanical methods can be used to establish grasses on the flatter areas of the project. The remainder of the area will be hand planted. Noxious weeds in the area will be controlled in order to improve the survival of the shrubs.



The treatment area is divided into three treatment units based on similar site characteristics. The location of the treatment units are shown on the Project Map.

The vegetative practices will be installed with hand labor on the steeper sites and with a mechanical pitter on the gentler sloping sites. The seed mixture, liming and fertilizer rates and transplant planting stock will be the same across all treatment areas. No lime will be applied to the calcareous soils.

The seeding mixture will be 80 percent "Sodar" streambank wheatgrass, 10 percent "Revenue" slender wheatgrass and 10 percent "Magnar" basin wildrye. Native shrub seed will be collected from the species growing on or near the project, cleaned and propagated by the State Department of Lands, Division of Forestry, State Forest Tree Nursery and hand transplanted.

The grass seed will be broadcast by hand at a rate of 80 seeds per square foot into excavated mini-basins spaced on a 2 foot by 2 foot grid contouring across the slope or planted mechanically into mechanically excavated pits or mini-basins. Fertilizer and lime will be applied to the mini-basins following the hand or mechanical pitting along with the seed. Ground lime will be applied to the mini-basins at a 2.2 tons per acre rate across areas requiring the amendment. Two hundred pounds of 16-20-00 fertilizer will be applied. Shrub seedlings of serviceberry, dogwood, Oregon grape, current, wild rose and snowberry will be hand planted on a 8 foot by 8 foot grid.

Treatment unit I consists of 77 acres of steep slopes that will be treated using hand labor. Lime and fertilizer will be incorporated into the mini-basins and then grasses will be planted. The following year after a grass stand has been established noxious weeds will be sprayed twice during the growing season. In year three the shrubs will be hand planted.

All 77 acres will not be treated in the first year. The west 20 acres of Treatment unit I will be treated first. The total installation will take place over a four year period and over three years for all subsequent plantings in Treatment I. Table A gives a schedule of installation for the project. There will be no planting during the second year of the project. This will allow evaluation of stands to see if any changes in treatments are needed or even if stands can be successfully established in these harsh conditions. If the evaluation shows that changes are needed in the methods of planting, these changes will be incorporated in remaining plantings and in any replanting that may be needed on the areas already planted. If the evaluation shows that the conditions are too severe to make successful plantings, no further plantings will take place and the project will be terminated.

Grass will be planted in the west area of Treatment area II the first year. Installation will also take place over a four year period with the second year being used to evaluate the grass planting. Since the slopes are not as steep mechanical methods will be used to plant the 51 acres of grass.



A machine will disturb the surface, incorporate the lime and fertilizer, and plant the grass. The mini-basins and planting grass in Treatment area II early in the project installation period will reduce the amount of runoff that would be flowing from Treatment area II to Treatment area I. This will help stabilize the lower slopes for revegetation measures. Noxious weeds would be sprayed in year 3 and shrubs would be planted in year 4. The east area of Treatment area II will be planted in year 3 with a three year installation period.

Treatment area III is similar to Treatment area I except lime does not have to be used in the planting. Seven acres would be hand planted in year 3, sprayed for noxious weeds in year 4, and shrubs planted in year 5.

An 85 percent survival is assumed for both the grasses and the shrubs. About 15 percent of the area will have to be replanted following the initial planting. The replanting will be cost shared the same as the initial planting.

#### IMPLEMENTATION OF SELECTED PLAN

The total cost of installation of the plan measures is estimated at \$257,300. Of this total, \$182,700 will be borne by RC&D funds, and \$74,600 will be provided by other funds. Details of these costs, which include construction, design, and administration, are presented in table 1.

The estimated construction cost includes all materials and labor necessary for installing the plan measures. Prices used in the estimate are based on 1985 and 1986 prevailing prices for installing similar measures in the project area. The estimated construction cost is \$210,300, of which 65 percent will be cost-shared by RC&D and 35 percent by other funds. (See table 1.)

The estimated cost of the design services and project administration is \$47,000 (\$46,000 RC&D funds and \$1,000 other funds). Project administration includes contract administration, inspection services and obtaining permits required for construction. Landrights and easements are a local cost and are estimated at zero since the sponsors will own the land before project installation will begin.

These costs are preliminary estimates. Actual costs incurred in the installation of the measure will be used to determine final costs borne by each party.

The Anaconda-Deer Lodge City-County government will provide the local funds through existing operating budgets and grants obtained from the state of Montana. Grant money is currently available to install the first part of the project and a grant request has been submitted for money to install latter parts of the project.



TABLE A  
SCHEDULE OF INSTALLATION

AREA	YEAR							
	1	2	3	4	5	6	7	8
39 Acres West Area II	\$9,500 Plant Grass	Evaluate Spray: Weeds:	\$800 : \$1,400 Replant Plant Shrubs	\$15,900 Replant Plant Shrubs	\$2,400 Replant			
20 Acres West Area I	\$26,100 Plant Grass	Evaluate Spray: Weeds:	\$400 : \$3,900 Replant Plant Shrubs	\$ 8,200 Replant Plant Shrubs	\$1,200 Replant			
20 Acres West Area I			\$26,100 Plant Grass	\$400 : \$3,900 Spray: Replant Weeds:	\$8,200 Plant Shrubs	\$1,200 Replant		
12 Acres East Area II			\$ 8,600 Plant Grass	\$100 : \$1,300 Spray: Replant Weeds:	\$4,900 Plant Shrubs	\$ 700 Replant		
7 Acres Area III			\$ 7,000 Plant Grass	\$100 : \$1,100 Spray: Replant Weeds:	\$2,900 Plant Shrubs	\$ 400 Replant		
17 Acres East Area I				\$22,200 Plant Grass	\$300 : \$3,300 Spray: Replant Weeds:	\$6,900 Plant Shrubs	\$1,100 Replant	
20 Acres East Area I					\$26,100 Plant Grass	\$400 : \$3,900 Spray: Replant Weeds:	\$8,200 Plant Shrubs	\$1,200 Replant
Financial Assistance	\$35,600	---	\$48,200	\$53,200	\$49,300	\$13,500	\$9,300	\$1,200
Technical Assistance	\$ 8,000	\$4,000	\$ 8,000	\$ 8,000	\$ 8,000	\$ 4,000	\$4,000	\$2,000



Land or water rights needed for the installation of this project are the responsibility of the Anaconda-Deer Lodge City-County government and are a local cost. The land is currently owned by the sponsors.

The SCS has been formally requested to do all the contracting. SCS will prepare notices to prospective bidders and invitations for bids and will award and administer all formal contracts.

Formal contracting will be used to install the grass planting in Treatment area II. Formal contracting involves awarding contracts based on competitive bids. The Anaconda-Deer Lodge City-County government will provide their share of the contract cost in cash.

"Force account" will be used to install the remainder of the project measures under a plan of operations prepared by Anaconda-Deer Lodge City-County government and concurred in by SCS. Included are the rest of the grass seeding, spraying for noxious weeds, and planting the shrubs. The value of work is determined by an estimate arrived at between the Anaconda-Deer Lodge City-County government and the SCS and is included in a project agreement for the work. The Anaconda-Deer Lodge City-County government has the necessary equipment and workforce and is skilled in performing the type of work contemplated.

Work done under the "force account" method will require certain detailed records to be kept to support Anaconda-Deer Lodge City-County government's request for reimbursement. As a minimum the following data will be required: 1) Invoices covering actual costs of materials. 2) Records showing materials actually used on the work, and disposition of excess materials. 3) Daily time records for each employee showing name, classification, wage rate, hours, and dates actually employed on the work. 4) Equipment operating records showing the rate, hours, and dates actually used on the work.

The Anaconda-Deer Lodge City-County government will be responsible for the operation and maintenance (O&M) of the improvements installed. An operation and maintenance agreement will be entered into between the Anaconda-Deer Lodge City-County government and SCS prior to execution of a project or services agreement. The agreement will provide for inspections, reports, and procedures for performing the maintenance items.

Operation includes the administration, management, and performance of nonmaintenance actions needed to keep a completed practice safe and functioning as planned.

Maintenance includes performing work or replacing a practice that has been damaged. This includes both routine and recurring needs. Damages to completed practices caused by excessive vandalism or fire is considered maintenance. Fertilizer application, spraying weeds, and re-establishing areas as a result of gully washing are also considered maintenance.



Operation and maintenance costs for this project are estimated at \$700 per year. Fertilizer and spot weed control are the main items in the estimated cost.

Inspections are necessary to ensure that the installed conservation practices are performing as planned. Inspections are to (a) assess the adequacy of the O&M activities; (b) identify needed O&M work; (c) specify means of performing needed work; and (d) set action dates for performing corrective actions.

The Anaconda-Deer Lodge City-County government is responsible for making the necessary inspections. Inspections will be made annually on a regularly scheduled basis for 15 years or as specified in the O&M agreement or other agreements. SCS may, depending on the availability of resources, assist the sponsor with the inspections. Inspection reports will be supplied to SCS following each inspection. Upon request, the Deer Lodge Valley Conservation District will provide technical assistance for maintenance.

#### EFFECTS OF SELECTED PLAN

Installation of the selected plan will reduce the amount of erosion that is taking place in the project area. In Treatment area I erosion would be reduced from 859 tons per year to 195 tons. Treatment area II would be reduced from 561 tons to 255 tons and Treatment area III would be reduced from 168 tons to 4 tons. Erosion in the project will be reduced from 2407 tons to 1273 tons each year with project installation. It will take three to five years before the project measures will significantly reduce erosion. See table B for details.

Runoff coming from the project area would be reduced and the peaks would be reduced. The mud flows coming down streets and plugging storm drains should be reduced. Maintenance costs incurred by Anaconda-Deer Lodge City-County government will be reduced.

Wildlife habitat will be improved with the planting of grass and shrubs. Moose, deer, grouse and other non-game wildlife use the area presently. The reduction in erosion will reduce the amount of suspended solids entering Warm Springs Creek which will improve the fish spawning area. Visual quality of the area will also be improved with the project.



Table B - Soil Erosion Effects of the Project

Area	Acres	Without Project Tons Lost	With Project Tons Lost	Tons Saved
I	77	859	195	664
II	51	561	255	306
III	7	168	4	164
Rest of	529	819	819	0
Totals	<u>664</u>	<u>2407</u>	<u>1273</u>	<u>1134</u>



TABLE 1 - ESTIMATED COST  
ANACONDA EROSION CONTROL & STABILIZATION CRITICAL AREA TREATMENT  
RC&D MEASURE PLAN

COST ITEM	UNIT	NUMBER	ESTIMATED			COST OTHER FEDERAL LAND	(DOLLARS) <sup>1</sup> NONFEDERAL LAND	TOTAL
			FEDERAL LAND	NONFEDERAL LAND	TOTAL			
CONSTRUCTION			136,700	136,700		73,600	73,600	210,300
ENGINEERING AND OTHER TECHNICAL ASSISTANCE			35,000	35,000				35,000
RELOCATION PAYMENTS			-0-	-0-		-0-	-0-	-0-
ADMINISTRATION			11,000	11,000		1,000	1,000	12,000
MITIGATION						-0-	-0-	-0-
TOTAL COSTS			182,700	182,700		74,600	74,600	257,300

<sup>1</sup>Price base 1986

July, 1986



APPENDIX A  
ENVIRONMENTAL EVALUATION



## ENVIRONMENTAL CONSIDERATION IN PLANNING

The importance of identified economic, social, environmental, and cultural concerns in the project area were evaluated (Table A). Those concerns of no significance or low significance to decisionmaking are not discussed or are only briefly discussed in the plan. Basic data concerning resources have been collected in order to determine the magnitude of project impacts. Significant concerns were used to compare alternatives.

TABLE A - Evaluation of Identified Concerns

Economic, Social, Environmental, and Cultural Concerns	Degree of Potential Impact	Degree of Significance to Decisionmaking	Remarks
Flood plain	None	None	
Floodwater and drainage	Major	High	
Erosion and sedimentation	Major	High	
Landuse change	None	None	
Prime agricultural land	None	None	
Water quality	Medium	Medium	
Visual resource	Medium	Low	
Endangered and threatened plants and animals	None	Low	
Mineral resource	None	None	
Air quality	None	None	
Wetlands	None	None	
Wildlife habitat	Minor	Minor	
Cultural resources	Minor	Minor	

<sup>1</sup>High - Must be considered in the analysis of alternatives

Medium - May be affected by some alternative solutions

Low - Considered, but not too significant

None - Need not be considered in analysis

Environmental and cultural resources routinely evaluated in project planning include threatened and endangered species, historic and archaeological sites, wetland, flood plains, wildlife and fishery resources, ecologically or environmentally unique and/or sensitive areas, visual resources, and water quality. Impacts on these resources resulting from implementation of planned alternatives are described below and, where necessary, in detail under each alternative.

- Threatened and endangered species. Field determination did not reveal the presence of resident or migratory threatened and endangered plants or animals. The U.S. Fish and Wildlife Service has been consulted regarding the official status of threatened and endangered species in the project area.



2. Historic and archaeological resources. According to an archaeological survey conducted by an archaeologist from the U.S. Forest Service one historical site was identified within the boundaries of the project area. This historical site is a wood stave conduit that was used to transport water from Warm Springs Creek to the Anaconda smelter. Activities within the planned project will not adversely impact this historical resource.
3. Wetland types or riparian land. There are no wetland types or riparian lands within the confines of the areas to be treated.
4. Flood plains. Project action does not involve activities within a recognized flood plain.
5. Wildlife. No significant wildlife populations are resident to the project area because of its close proximity to the City of Anaconda. The area receives occasional use by mule deer, and infrequent use by moose. The area supports a variety of non game birds and mammals. Since there will be no change in land use patterns within the project area with implementation of project measures there will be no impact on resident and/or migratory wildlife within the project area.
6. Fisheries. There are no perennial streams within the project boundaries.
7. Ecologically unique and/or sensitive areas. No unique or sensitive areas have been identified.
8. Visual resources. Impacts to the visual resource associated with implementation of the planned alternative were assessed. Establishment of vegetation, woody and herbaceous, associated with the selected alternative will over time improve the quality of the visual resource and reduce erosion.
9. Water quality. Water quality will be enhanced through the reduction of heavy metal contaminated sediment delivered to Warm Springs Creek through implementation of the planned alternative.
10. Pesticide use. Some herbicides will be applied prior to planting of woody plants to reduce infestations of noxious weeds and remove plant competition. Following completion of the project planned maintenance provides for the control of noxious weeds through the use of herbicides. This application will be confined only to those areas planted.
11. Prime and unique farm land. No prime and/or unique farm land has been identified within the project area.
12. Air quality. No impacts, either positive or negative, are likely to occur with implementation of the selected alternative.



## DESCRIPTION OF ALTERNATIVES AND ENVIRONMENTAL EFFECTS

### Formulation of Alternatives

A broad range of resource problems and potential opportunities was considered. Opportunities for public involvement, as well as input from federal, state and local agencies were provided throughout the identification process.

Two alternatives were developed in the planning process--the no action alternative and the selected alternative. The no action alternative would allow for continuance of sedimentation and off-site impacts to the City of Anaconda and Warm Springs Creek.

The selected alternative is a critical area treatment of eroding lands within the project area by the establishment of woody and herbaceous vegetation. This alternative will reduce overland flow, sedimentation, and metals contamination. Following the successful establishment of project measures it was judged there will be a significant improvement in the environmental amenities of the area.

### COORDINATION

The following individuals and their agencies participated in the environmental scoping of this project measure:

Bill Jones, U.S. Fish and Wildlife Service  
Ron Batchelor, Soil Conservation Service  
Gerald Schaefer, Soil Conservation Service  
Bob Tribelhorn, Soil Conservation Service

A representative of the Montana Department of Fish, Wildlife and Parks was invited but did not participate in the scoping of this project measure.

### PREPARATION

This environmental assessment was prepared by R.F. Batchelor, Biologist, and Gerald Schaefer, Economist, Soil Conservation Service, Bozeman, Montana



TABLE B  
 ANACONDA EROSION CONTROL & STABILIZATION CRITICAL AREA  
 TREATMENT RC&D MEASURE PLAN  
 ENVIRONMENTAL EVALUATION SUMMARY

Environmental Factors	Present Status or Setting	Effects <sup>1</sup>		Changes in Quality of Environment <sup>1</sup>	
		Future w/o Project	1	Alternatives & Anticipated Impacts	2

A. Visual Resources

1. Visual quality and aesthetics

a. Landform	Adjacent to urban area		
b. Vegetation	Rural Setting	A	A
c. Water	Range & woodland limited by metal contaminants	A	C
	No water bodies or live streams present	---	---

B. Quality Considerations of Air, Land, and Water

1. Air

a. Installation period	Good	A	A
b. Project duration	Good to Excellent	A	A

2. Land

a. Soil erosion (water)	High	A	C
b. Recreation lands	Not significant	---	---
c. Changes in natural plant communities	Slight	A	B
d. Wetlands	None	---	---
e. Riparian lands	None	---	---
f. Flood plains	None	---	---

3. Water

a. Perennial streams	None	---	---
b. Ponds, lakes, reservoirs	None	---	---



Table 4 Continued

Environmental Factors	Present Status or Setting	Effects <sup>1</sup>		Changes in Quality of Environment	
		Future w/o Project	1	Alternatives & Anticipated Impacts <sup>1</sup>	2
C. <u>Biological Resources and Selected Ecological Systems</u>					
1. Threatened or endangered plants and animals	None resident or migratory to area	---	---	---	---
2. Wildlife habitats					
a. Wetlands	None	---	---	---	---
b. Upland	Low, Cover deficient due to heavy metal contamination and proximity to urban area	A		B	
c. Riparian	None	---	---	---	---
3. Ecologically unique areas	None	---	---	---	---
D. <u>Historic, Archaeological and Unique Geological Resources</u>					
1. Historic sites	1	A		A	
2. Archaeological sites	None	---	---	---	---
3. Geological areas	None	---	---	---	---

<sup>1</sup>Future Conditions

A = Essentially no change from present condition

B = Small increase over present condition

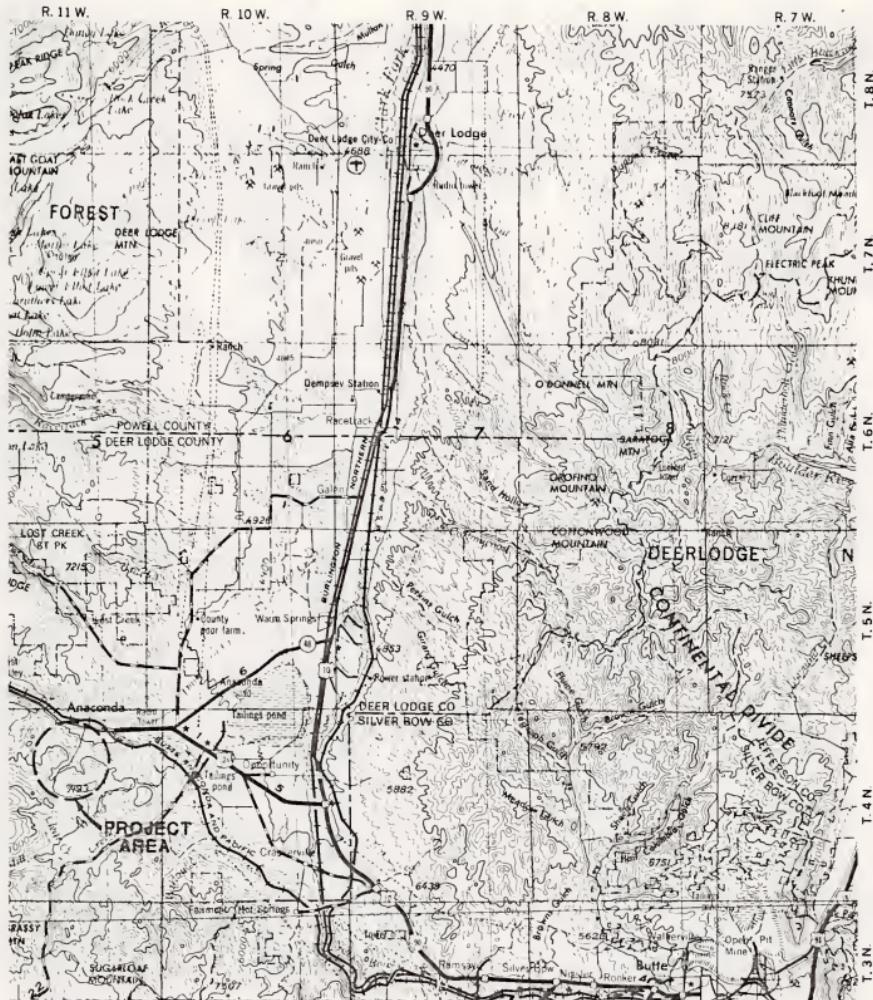
C = Moderate to large increase over present condition

D = Small decrease over present condition

E = Moderate to large decrease over present condition

The anticipated impacts are compared with effects of the future without project and based on changes in quality of the environment.





## LOCATION MAP



**LOCATION MAP**  
**ANACONDA EROSION CONTROL**  
**AND STABILIZATION**  
**DEER LODGE COUNTY, MONTANA**

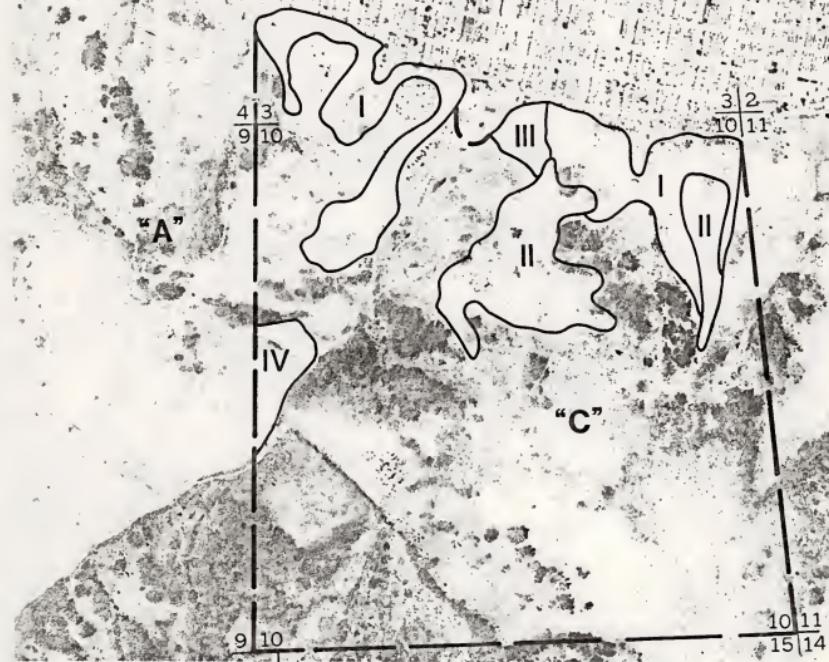
SCALE: 1 inch = 4 miles



R. 11 W.

Anaconda

T. 4 N.



— Project Boundary

- I - Volcanics and quartzites with 35-60 percent slope
- II - Volcanics and quartzites with 15-35 percent slope
- III - Shallow limestone and volcanics with 35-70 percent slope
- IV - Volcanics and quartzites with > 60 percent slope



LOCATION MAP



**PROJECT MAP  
ANACONDA EROSION CONTROL  
AND STABILIZATION  
DEER LODGE COUNTY, MONTANA**

APPROX. SCALE: 4 inches = 1 mile

